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ABSTRACT

This report, the second in the 1975-76 series, is directed toward the local school district staff whose responsibility it is to read, interpret, and use the data generated by the Michigan Educational Assessment Program. This report combines in one booklet information that in previous years was contained in two booklets: the Individual Pupil Report: Explanatory Materials, and the School and District Report: Explanatory Materials. This booklet will be of particular value to the school principal and teachers. The 1975-76 Michigan Educational Assessment Program included objective-referenced tests in reading and mathematics at the fourth and seventh grades, a statewide pilot at the first grade, and a developmental pilot effort at the tenth grade with several volunteer schools. This report is devoted to an interpretation of the fourth and seventh grade data. In this report, the reader will find a discussion of the assessment measures, a detailed explanation of how to read each of the data reports generated by the program, and a set of suggested procedures for utilizing the test results. Some of this information can also be found on the principal's and teacher's test results folder provided to each participating school principal and teacher. (Author)

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ED120227

2nd report

UNDERSTANDING & UTILIZING THE DATA OF THE 1975-76 MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
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Michigan Department of Education

UNDERSTANDING AND UTILIZING THE DATA OF THE 1975-76 MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM

The Second Report of the 1975-76
Michigan Educational Assessment Program

Prepared by Research, Evaluation and Assessment Services

Michigan Department of Education

Lansing, Michigan

July 1975

FOREWORD

This report, **Understanding and Utilizing the Data of the 1975-76 Michigan Educational Assessment Program,** is intended to assist local school district personnel in the interpretation of the data from the assessment program. The report discusses the individual student, classroom, school, and district data and suggests ways to achieve maximum utilization of these data. The report has been summarized in the folders which principals and teachers receive with the test results.

The Michigan Educational Assessment Program (MEAP) was initiated by the State Board of Education, supported by the Governor, and funded by the Legislature initially through enactment of Act 307 of the Public Acts of 1969 and, subsequently, under Act 38 of the Public Acts of 1970. The program, now in its seventh year, has been improved and up-dated each year so that it produces valuable information on the extent to which Michigan students have attained certain basic performance objectives. This information can be of great assistance to school teachers and principals as they conduct their instructional planning.

Thanks are due to a large number of Michigan teachers, school administrators, and lay citizens for their cooperation with and assistance to the Department in developing the assessment program. Educators and other citizens were involved in the development and reviews of the performance objectives which form the basis of the objective-referenced reading and mathematics tests used in the 1975-76 program. The tests were initially developed during 1972-73 in several Michigan school districts and have been reviewed yearly by representative groups of the state's reading and mathematics curriculum specialists. The program was designed and administered by Research, Evaluation and Assessment Services (REAS) with the assistance of technical support contractors and the advice of the REAS Advisory Council.

This report was prepared by the staff of the Michigan Educational Assessment Program. Comments or questions should be directed to them.

John W. Porter

Superintendent of Public Instruction

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INTRODUCTION

This report, the second in the 1975-76 series, is directed toward the local school district staff whose responsibility it is to read, interpret, and use the data generated by the Michigan Educational Assessment Program. This report combines in one booklet information that in previous years was contained in two booklets: the **Individual Pupil Report: Explanatory Materials** and the **School and District Report: Explanatory Materials.** This booklet will be of particular value to the school principal and teachers.

The 1975-76 Michigan Educational Assessment Program included objective-referenced tests in reading and mathematics at the fourth and seventh grades, a statewide pilot at the first grade, and a developmental pilot effort at the tenth grade with several volunteer schools. This report is devoted to an interpretation of the fourth and seventh grade data.

In this report, the reader will find a discussion of the assessment measures (Section I), a detailed explanation of how to read each of the data reports generated by the program (Section II), and a set of suggested procedures for utilizing the test results (Section III). Some of this information can also be found on the principal's and teacher's test results folder provided to each participating school principal and teacher.

SECTION I

DESCRIPTION OF THE EDUCATIONAL ASSESSMENT MEASURES

The 1975-76 Michigan Educational Assessment Program reported 19 separate measures in the areas of: (a) Human Resources, (b) District Financial Resources, (c) Percent Minority, (d) Dropout Rate, (e) Student Achievement, and (f) Size. Some of these are aggregated and reported only at the district level while others are available at the school, classroom, or student levels. Listed in TABLE I are each of the 19 measures and the level of reporting for each. APPENDIX A provides a definition of each measure and indicates the year in which the information was collected.

Non-Achievement Measures

To assist in the interpretation of the non-achievement measures shown in TABLE I, normative distributions have been provided in APPENDIX B. For those non-achievement measures which are reported at the district level, a distribution of values for all K-12 districts in the state is shown. By referring to this distribution, the district value on any particular measure can be compared to the values of all K-12 districts.

For those measures which are reported at the school level, distributions have been provided separately for schools in K-12 districts with fourth and seventh grades. Use of these distributions permits comparison of a local school average with averages of all other schools that have students at that same grade.

These norm tables are useful because they permit the construction of descriptive profiles of the human and financial resource information. While such profiles are useful for descriptive purposes, they are not necessarily useful for predictive purposes. One should not assume that a given percentile ranking on one variable will indicate the percentile rankings on any other variables.

Achievement Measures

The 1975-76 educational assessment provided achievement measures in reading and mathematics for every fourth and seventh grade public school student. These tests were objective-referenced in design, and each contained sets of items which measured a selected set of minimal performance objectives in the two subject areas. The objectives tested were selected from those developed by educators in the state and adopted by the State Board of Education. They represent certain minimal expectancies which almost all beginning fourth and seventh grade students should have attained.

The objectives tested in 1975-76, similar to those tested in 1974-75, are listed in APPENDIX C. For the most part, the same objectives have been tested for three years. However, there have been improvements made in some test items, and a few objectives are no longer being tested.

Mathematics Tests. Because of testing time limitations, not all of the minimal mathematics performance objectives were included in the 1975-76 educational assessment. There are other important minimal performance objectives for the end of grades three and six which were not included in the 1975-76 tests.

The fourth grade mathematics test measured 30 objectives; the seventh grade test measured 40 objectives. Each mathematics test included a few problems presented orally by the test administrator.

There were five multiple choice questions to measure each objective. The tests were untimed, and students were allowed to work at their own pace to complete the work. Student scores, classroom summaries, school summaries, and foil analyses are included in the data returned to each school.

TABLE I

MEASURES AGGREGATED AND REPORTED AT THE FOURTH AND SEVENTH GRADE LEVELS

Measures	Level of Aggregation and Reporting				
	State	District	School	Classroom	Individual
A. Human Resources (1974-75)					
1. Professional Instructional Staff per 1,000 Pupils	X	X	X		
2. Teachers per 1,000 Pupils	X	X	X		
3. Average Years Teaching Experience	X	X	X		
4. Percent of Teachers with Master's Degree or Above	X	X	X		
5. Average Contracted Salary per Teacher	X	X	X		
B. District Financial Resources (1973-74)					
6. State Equalized Valuation per State Aid Membership	X	X			
7. Local Revenue per Pupil	X	X			
8. State School Aid per Pupil	X	X			
9. K-12 Instructional Expense per Pupil	X	X			
10. Elementary Instructional Expense per Pupil	X	X			
11. Total Current Operating Expense per Pupil	X	X			
12. Total Operating Millage	X	X			
C. Percent Minority (1974-75)					
13. Percent of Racial-Ethnic Minority Students	X	X	X		
D. Dropout Rate (1973-74)					
14. School Dropout Rate	X	X			
E. Student Achievement (1975-76)					
15. Reading	X	X	X	X	X
16. Mathematics	X	X	X	X	X
F. Size (1974-75)					
17. Grade 4 Membership	X	X	X		
18. Grade 7 Membership	X	X	X		
19. Total Membership	X	X	X		

Reading Tests. The reading objectives included in the educational assessment were taken from the Communication Skills minimal performance objectives. As with the mathematics assessment, not all of the reading objectives were tested.

The fourth grade reading test measured 19 objectives and the seventh grade test measured 20 objectives. The fourth grade test included several items which were presented orally by the test administrator.

As with the mathematics tests, there were five multiple choice questions to measure each objective. The tests were untimed, and student scores, classroom summaries, school summaries and foil analyses are provided.

SECTION II

UNDERSTANDING THE EDUCATIONAL ASSESSMENT REPORTS

Reading the Reports

Local school and district staff will receive various types of reports from the 1975-76 Michigan Educational Assessment Program. These reports are:

(1) Individual Student Report

(2) Classroom Listing Report

(3) School Summary Report

(4) Foil Analysis (School and District)

(5) District Summary Report

(6) Feeder School Report (optional)

(7) Research Code Report (optional)

These reports serve two functions—to describe an individual student's test performance and to summarize various groupings of students' scores.

The purpose of this section of this booklet is to explain how to read the data found on these report forms. Since the reports are similar to those of previous years, reference may be made to materials developed by the Department in the past such as the filmstrip "Interpreting the Results of the 1973-74 Michigan Educational Assessment Program." The fourth and seventh grade reports are almost identical, so the illustrations are restricted to the fourth grade.

Individual Student Report. The Individual Student Report, shown in FIGURE 1, presents a student's performance on each test item for all the mathematics and reading objectives and indicates attainment or non-attainment of each objective. One report sheet is provided for each student who participated in the assessment, except that seventh graders' results are on two sheets: one for mathematics and one for reading.

As can be seen in FIGURE 1, Section A, near the top of the report, contains identification information including the pupil name, teacher name, school building, and school district. Immediately below this is the mathematics section of the report.

The numbers assigned to each mathematics and reading objective appear in Section B. A brief description of each of the objectives appears in Section C on the slanted lines immediately below the objective number. Each description is a brief statement of the objective. The complete wording of the objectives may be found in APPENDIX C or in the booklets of minimal performance objectives which have been sent to each school district.

STUDENT: MCCARY, MARY SCHOOL: FUDGEVILLE ELEM.

TEACHER: MS. SUDBURY DISTRICT: FUDGEVILLE COMM.

INDIVIDUAL STUDENT REPORT

MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM
1975-76 (YEAR 7)

GRADE 4

MATHEMATICS

OBJECTIVE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL OBJECTIVES ATTAINED
OBJECTIVE ATTAINED?	N	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	25
96	+	11	+	141	131	*	126	+	41	+	81	+	146	H	21	+	71	+	26	+	61	+	56	+	51	+	136	+	91	A	31	+	76	J	111	+	151	+	16	+	66	+	1	+	106	+	36	+	101	*	46	+	86	+	116	+	121	+
97	+	12	+	142	132	+	127	A	42	+	82	G	147	B	22	+	72	+	27	+	62	+	57	+	52	+	137	+	92	+	32	+	77	+	112	+	152	+	17	+	67	B	2	+	107	+	37	+	102	+	47	+	87	A	117	+	122	+
98	H	13	+	143	133	+	128	+	43	+	83	+	148	*	23	+	73	C	28	+	63	+	58	+	53	+	138	+	93	+	33	+	78	+	113	C	153	+	18	+	68	+	3	B	108	+	38	+	103	A	48	+	88	+	118	+	123	+
99	A	14	+	144	134	+	129	+	44	+	84	+	149	A	24	+	74	+	29	+	64	+	59	+	54	F	139	+	94	+	34	+	79	D	114	+	154	+	19	+	69	+	4	+	109	+	39	+	104	+	49	+	89	+	119	+	124	+
100	*	15	+	145	B	135	+	130	h	45	+	85	+	150	+	25	+	75	+	30	+	65	+	60	*	55	+	140	+	95	+	35	+	80	G	115	+	155	+	20	+	70	+	5	+	110	+	40	+	105	A	50	+	90	+	120	+	125	+
NUMBER CORRECT	2	5	4	4	3	5	4	1	5	4	5	5	4	4	5	4	5	4	5	2	4	5	5	4	4	5	5	2	5	4	5	5

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READING

OBJECTIVE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	TOTAL OBJECTIVES OBTAINED
OBJECTIVE ATTAINED?	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	Y	14
200	+	220	+	240	161	D	6	+	172	+	200	+	189	+	206	+	166	+	170	+	187	+	202	+	156	+	208	+	167	+	209	+	205	+	176	+
201	D	221	+	241	162	+	7	+	173	C	201	+	177	+	208	+	185	+	189	+	193	+	204	F	157	+	209	+	191	+	210	+	206	+	177	A
202	F	222	+	242	*	+	8	+	174	+	202	+	178	+	209	A	196	+	220	+	217	+	220	+	158	+	210	+	216	+	202	+	207	+	178	+
203	+	223	+	243	164	+	9	+	175	+	203	+	221	+	210	+	215	B	236	+	222	+	224	+	159	+	256	+	227	A	203	+	208	+	222	A
204	+	224	+	244	165	+	10	+	176	+	204	+	243	+	242	+	241	+	244	+	233	*	228	+	160	+	245	+	240	F	204	+	209	*	220	B
NUMBER CORRECT	3	5	4	4	5	4	5	4	3	3	4	4	4	5	4	3	5	4	2		

Section D shows the "OBJECTIVES ATTAINED?" line. This indicates whether or not the student attained each objective. If the student has attained the objective, there is a capital letter Y (for YES) in the box. If the student has not attained the objective, there is a capital N (for NO) in the box. The student must have answered correctly at least four of the five test items measuring each objective in order to be scored as attaining the objective. If the "OBJECTIVE ATTAINED?" line is left blank, this indicates the student did not progress far enough through the test for status on the performance objective to be determined.

Section E indicates the test item numbers that measured each objective and whether the student's responses were correct or incorrect for each item. A correct response is indicated with a plus (+) sign. An incorrect response is shown by a letter indicating the student's incorrect choice. An asterisk (*) is used to indicate that the student did not respond to an item, while a blank space shows that the student did not reach the item.

Section F shows the total number of items the student answered correctly for each objective. The total number of mathematics objectives attained is displayed at G.

The Reading portion of the report, Section I, contains information similar to the Mathematics portion. Both portions indicate how each test item for each objective was answered, whether the student has attained each objective, and the total numbers of mathematics and reading objectives attained. Inasmuch as the mathematics and reading tests are not designed to rank students on overall achievement, percentile ranks are not given.

The "COMMENTS" section of the Individual Student Report, Section H, is for the convenience of educators who receive and use the report. It can be used to make notations regarding the student's performance and to note highlights of the test report.

Classroom Listing Report. The Classroom Listing Report summarizes, for an entire classroom, the information contained on the Individual Student Reports, and it allows the local educator to examine quickly the status of all students in the classroom on each mathematics and reading objective.

An example of the Classroom Listing Report for grade four mathematics is shown in FIGURE 2. A similar report is provided for the reading objectives. As can be seen, this report restates the "OBJECTIVE ATTAINED?" line from each of the Individual Student Reports for a particular classroom.

Section A of the report provides identification information: teacher name, school building, district, and grade level. Section B contains the objective numbers which are the same as those used on the Individual Student Report. The objective descriptions shown in Section C of this report are identical to those used on the Individual Student Report.

Section D contains information on each student in the classroom for each objective. Each student's name is printed in the left hand column and the status on each objective is printed on the line across from the name. Again, attained objectives are indicated with a capital letter Y (for YES), and objectives not attained are indicated with a capital N (for NO).

A → TEACHER: MR. GOODFELLOW DISTRICT: TIMBERLINE COMM.

SCHOOL: TIMBERLINE ELEM. GRADE: FOUR DATE TESTED: 10/75

CLASSROOM LISTING REPORT

MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM 1975-76 (YEAR 7)

GRADE **4**

MATHEMATICS

B → OBJECTIVE NO.

C → OBJECTIVE DESCRIPTION

STUDENT NAME			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL OBJECTIVES ATTAINED
BIGGS	ROBBIE	F	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	23
CLARK	LYNN	K	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	21
DEJONG	CLARE	S	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	N	Y	Y	N	Y	Y	N	Y	23
DID	KATIE	A	Y	Y	N	N	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	24
DIXON	DANIEL	R	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	N	Y	Y	N	Y	N	Y	Y	21
DUECE	DICK	M	Y	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	Y	N	Y	N	N	Y	Y	N	Y	11
FACKLER	MARIA	S	Y	Y	Y	N	N	Y	N	N	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	21
FOX	MARK	E	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	Y	N	N	N	Y	Y	Y	Y	N	Y	N	Y	N	19
GATES	MIKE	R	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	24
JOHNSON	DALE	H	Y	N	Y	N	Y	N	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	20
JONES	WILLIE	T	N	Y	N	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	26
LANE	LOIS	E	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	26
ROBERTS	MIKE	B	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	22
SANTARO	JOSE	M	Y	Y	Y	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y	Y	Y	N	Y	Y	N	22
SMITH	FREDDIE	N	Y	Y	N	N	Y	N	N	N	Y	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	20
PERCENT OF PUPILS ANSWERING																																		
0 ITEMS CORRECT					2	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	5	0	3	0	0	0	0	0	0	0	2	0	
1 ITEM CORRECT					5	0	0	0	3	5	2	3	5	3	8	7	3	25	3	0	3	15	0	4	0	0	0	0	0	0	0	5	0	
2 ITEMS CORRECT					8	3	7	12	15	10	15	5	7	10	15	10	10	25	10	3	15	10	3	10	3	6	0	3	7	8	14	3	8	7	
E → 3 ITEMS CORRECT					12	17	20	15	15	25	10	25	10	20	10	10	20	10	20	10	15	10	30	10	17	14	0	17	40	5	10	17	12	20	
4 ITEMS CORRECT					70	63	50	55	52	40	41	50	59	54	52	41	50	40	40	50	52	40	50	41	63	63	25	63	40	50	41	63	70	50	
5 ITEMS CORRECT					3	17	23	18	15	20	32	17	14	13	15	32	17	0	27	37	15	20	17	32	17	17	75	17	13	37	32	17	3	23	
F → PERCENT OF PUPILS ATTAINING OBJECTIVE			73	80	73	73	67	60	73	67	73	67	67	73	67	40	67	87	67	60	67	73	80	80	A	80	53	87	73	80	73	73		

FIGURE 2: CLASSROOM LISTING REPORT

Near the bottom of the form at Section E appears a score distribution for each objective. This distribution shows the percent of students in the classroom who answered 0, 1, 2, 3, 4, or 5 items correct for each of the objectives. If 100% of the students attained an objective, the letter "A" will appear. Below the distribution, in Section F, is a summary of the percent of students who correctly answered either four or five of the five items for each objective and are thus classified as attaining the objective.[1]

School or District Summary. The School or District Summary is used to report the assessment data for each school and district. Since the report forms are identical in appearance, only the school version will be illustrated here.

An example of the first page of this two-page report is shown in FIGURE 3. The second page is a continuation of the information and contains the same types of data. As with the previous illustrations, FIGURE 3 is marked with various letters for purposes of explanation.

Section A of the report contains identification information: the type of report (whether a school or district summary), the district name and code, the school name and code (for a school report), and the grade tested.

Section B shows the percent of students who responded correctly to 0, 1, 2, 3, 4, or 5 of the items for each objective. This distribution is similar in function to Section E of the Classroom Listing Report.

Section C of the report shows the percentage of students who attained each objective. The total number of students in the school who were tested is included in D. Sections E and F contain the same objective numbers and descriptions which appear on the Individual Student Report and the Classroom Listing Report.

The objective codes in Section G refer to the coding system used in the complete set of mathematics and reading objectives published by the Department of Education which have been made available to all Michigan school districts. The objectives tested in 1975-76 are included in APPENDIX C.

Data on the district or school human and financial resources is presented in Section H. Because some of this information is not collected at the school level, different data appear on the school and district summaries.

Foil Analysis. The Foil Analysis, a new feature of the educational assessment program, is provided to assist school and district staff in interpreting the test results. It is a display of the percentage of students selecting each possible answer for each test question. The Foil Analysis has been prepared at the district and school levels.

FIGURE 4 shows an example of the Foil Analysis at the school level. Identification information, including subject area, appears at the top of the form in Section A. Each objective tested is numbered, Section B, following the same pattern described earlier. For each objective, the numbers of the matching test items are listed from left to right across the page in Section C.

The letters representing each answer choice for each test item are shown in Section D. In the test, the letter sequence varied for each item. It was either A, B, C, D, E or F, G, H, J, K. Reference should be made to a copy of the test to ascertain which sequence was used for each item.

The percent of students selecting each foil is shown in Section E along with the percent omitting the item, Section F. If all students chose the correct answer, which is indicated by an asterisk, a capital letter A appears.

[1]The use of "A" to designate 100% occurs only on the Classroom Listing Report and the Foil Analysis.

MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM 1975-76 (YEAR 7)

SCHOOL SUMMARY

DISTRICT: TOYLAND COMM.
CODE: 93-232

A → SCHOOL: TOYLAND ELEM.
CODE: 8293

GRADE: FOUR

DATE TESTED: 10/75

SCHOOL OR DISTRICT SUMMARY

* * * * * HUMAN AND FINANCIAL RESOURCE INFORMATION * * * *	
	* * * HUMAN RESOURCES * * *
50.4	PROFESSIONAL INSTRUCTIONAL STAFF PER 1000 PUPILS
4.0	AVERAGE YEARS TEACHING EXPERIENCE
$11,890	AVERAGE CONTRACTED SALARY PER TEACHER
	* * * PERCENT MINORITY * * *
0.0%	PERCENT OF RACIAL-ETHNIC MINORITY STUDENTS
	* * * SIZE MEASURES * * * ← H
189	GRADE 4 MEMBERSHIP
414	TOTAL MEMBERSHIP

PERCENT OF STUDENTS ANSWERING						% PUPILS ATTAINED OBJECTIVE	NUMBER OF PUPILS	OBJ. NO.	OBJECTIVE	OBJECTIVE CODE
0 ITEMS CORRECT	1 ITEM CORRECT	2 ITEMS CORRECT	3 ITEMS CORRECT	4 ITEMS CORRECT	5 ITEMS CORRECT					
									* * * * * * MATHEMATICS * * * * * *	
B →							87	1	INDICATE OBJECTS THAT ARE SAME SIZE	AR-I-A-6
0	0	0	0	3	97	100	87	2	INDICATE SIMILAR GEOMETRIC SHAPES	AR-I-A-8 ← G
							87	3	INDICATE OBJECTS ARRANGED FULL TO EMPTY	AR-I-A-16
C →	0	0	0	2	0	98	98	87	4	INDICATE LONGEST AND SHORTEST OBJECTS	AR-I-A-24
							87	5	INDICATE FIRST AND LAST	AR-I-A-39
D →	1	2	1	3	11	80	91	87	6	CHOOSE EQUIVALENT SETS	AR-I-B-7
							87	7	CHOOSE SETS HAVING FEWER NUMBERS	AR-I-B-32
E →	0	3	3	3	11	78	89	87	8	INDICATE APPROPRIATE NUMERAL FOR POINT ON A LINE	AR-I-B-40
							87	9	CHOOSE GREATEST AND LEAST NUMBER	AR-I-B-43
F →	0	0	1	0	0	99	99	87	10	CHOOSE NUMBER BETWEEN TWO NUMBERS	AR-I-B-44
							87	11	CHOOSE NUMBER BEFORE OR AFTER A NUMBER	AR-I-B-45
	0	0	1	1	23	75	98	87	12	IDENTIFY A NUMERAL LESS THAN A 100	AR-I-B-64
							87	13	INDICATE NUMBER BEFORE OR AFTER NUMBER WITHIN A DECADE	AR-I-B-65
	0	0	0	3	9	87	96	87	14	INDICATE WHICH OF 2 NUMBERS IS GREATER OR LESS	AR-I-B-67
							87	15	INDICATE THE VALUES OF A SET OF DIMES AND PENNIES	AR-I-B-70
	5	5	6	13	23	49	72	87	16	CHOOSE LIST OF NUMBERS IN ASCENDING ORDER	AR-I-B-81

FIGURE 3: DISTRICT SUMMARY

A → SCHOOL: TOYLAND ELEM.
DISTRICT: TOYLAND COMM.
SUBJECT: MATHEMATICS GRADE: FOUR

CODE: 8293
CODE: 93-232
Page 1 of 1

MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM
1975-76 (YEAR 7)

FOIL ANALYSIS

B ↓ C ↓ D ↓

OBJ	Item	Percent Choosing A/F	B/G	C/H	D/J	E/K	Omit
1	96	*80	5	5	5		5
2	11	0	20	5	*70		5
3	141	5	10	*60	10		15
4	131	5	5	5	*80		5
5	126	10	0	5	10	*70	10
6	41	5	10	15	*60		10
7	81	*80	5	5	5		5
8	146	0	20	40	*40		0
9	21	10	*80	10			0
10	71	5	*75	10	5		5
11	26	0	*A	0	0		0
12	61	0	*95	0	0		5
13	56	10	*80	0	0		10
14	51	10	*80				10
15	136	*80	5	10	5		0
16	91	10	*90	0	0		0
17	31	20	*70				10
18	76	5	10	*60	10		15
19	111	10	*80	10	0		0
20	151	0	20	35	*45		0
21	16	0	0	*95	0		5
22	66	0	*80	5	0		15
23	1	0	0	0	*A		0
24	106	*60	5	10	20		5
25	36	5	5	*80	5		5
26	101	*90	0	0	10		0
27	46	5	5	*80	5		5
28	86	20	5	*70	5		0
29	116	20	*80	0	0		0
30	121	5	*90	5	0		0

Item	A/F	B/G	C/H	D/J	E/K	Omit
97	30	*60	5	5		0
12	*80	10	5	5		0
142	*70	5	20	5		0
132	5	30	*60	5		0
127	0	5	10	10	*70	5
42	*50	5	10	10		25
82	30	5	5	*60		0
147	25	5	*70	0		0
22	*70	10	10			10
72	0	0	*80	10		10
27	0	*90	5	0		5
62	5	*80	5	10		0
57	0	0	*90	10		0
52	*70	25				5
137	10	20	*70	0		0
92	*60	25	5	10		0
32	*70	10				20
77	0	*90	5	0		5
112	0	0	*90	10		0
152	30	10	0	*60		0
17	30	*60	5	5		0
67	0	0	5	*90		5
2	*A	0	0	0		0
107	20	0	*80	0		0
37	*75	20	5	0		0
102	5	5	*80	10		0
47	*90	5	0	5		0
87	0	*80	5	5		10
117	0	0	*60	40		0
122	0	25	5	*70		0

Item	A/F	B/G	C/H	D/J	E/K	Omit
98	10	15	5	*70		0
13	75	5	0	*20		0
143	5	*60	25	0		10
133	10	*70	15	5		0
128	*60	10	5	10		15
43	5	5	*70	15		5
83	10	*60	20	0		10
148	*80	10	5	5		0
23	20	5	*70			5
73	*A	0	0	0		0
28	10	15	25	*40		10
63	10	20	*60	5		5
58	5	20	*70	5		0
53	*80	5				15
138	5	*25	25	45		0
93	10	5	5	*75		5
33	*50	25				25
78	10	20	*60	5		5
113	10	15	25	*40		10
153	*A	0	0	0		0
18	10	20	*65	0		5
68	*60	20	5	5		10
3	*A	0	0	0		0
108	10	*80	10	0		0
38	30	25	20	*25		0
103	20	30	*25	25		0
48	20	5	*70	5		0
88	90	*0	5	5		0
118	10	10	*75	5		0
123	*85	5	10	0		0

Item	A/F	B/G	C/H	D/J	E/K	Omit
99	10	*50	20	10		10
14	10	*70	5	15		0
144	*75	5	10	10		0
134	10	*50	10	20		0
129	*70	10	10	5	5	0
44	10	10	*50	20		10
84	5	10	*60	10		15
149	10	15	*75	0		0
24	*80	10	5			5
74	10	25	*45	15		5
29	*60	40	0	0		0
64	*80	5	5	5		5
59	5	*90	0	5		0
54	30	*70				0
139	0	*90	0	10		0
94	5	*85	10	0		0
34	*80	10				10
79	10	25	*45	15		5
114	*80	5	5	5		5
154	5	10	*60	10		15
19	15	10	25	*50		0
69	0	0	5	*70		25
4	5	0	0	*95		0
109	*95	0	5	0		0
39	5	10	*60	20		5
104	30	*20	25	20		5
49	0	30	*70	0		0
89	20	5	*70	5		0
119	5	5	5	*80		5
124	0	*95	5	0		0

Item	A/F	B/G	C/H	D/J	E/K	Omit
100	10	5	*75	5		5
15	20	20	*50	5		0
145	20	10	5	*60		5
135	10	5	5	*75		5
130	*50	10	20	10	10	0
45	10	5	*75	5		5
85	10	*70	10	5		5
150	5	*70	10	10		5
25	5	5	*80			10
75	25	*35	10	10		25
30	10	5	*70	5		10
65	0	10	*80	5		5
60	*70	15	5	10		0
55	*50	50				0
140	5	5	5	*70		15
95	5	5	*60	20		10
35	25	*75				0
80	20	10	5	*60		5
115	25	*45	5	20		5
155	20	20	*50	5		0
20	*75	20	0	5		0
70	*30	5	15	25		25
5	0	0	*90	10		0
110	30	5	*45	10		10
40	5	*70	20	5		0
105	25	*50	20	5		0
50	0	10	*90	0		0
90	0	70	0	*30		0
120	*A	0	0	0		0
125	25	5	*70	0		0

FIGURE 4: FOIL ANALYSIS

Information about incorrect answers chosen by a large percent of students may be diagnostically useful. Common misconceptions, partial information and inappropriate methods of solving problems are often the basis for students choosing the wrong answers. Analysis of this wrong answer data can help educators to plan remedial work and to redesign instructional strategies.

Feeder School and Research Code Reports. The 1975-76 Michigan Educational Assessment Program offered school districts two optional reports: the Feeder School and the Research Code Reports. Since these were district options, the reports were not prepared unless requested by the district.

For districts choosing the Feeder School option, a summary report, similar to the one shown in FIGURE 3, was prepared for each elementary school which "feeds" students into the junior high school(s). These optional reports should be interpreted in the same manner as a school or district summary.

Use of the Research Code option was designed to produce summary reports, similar to the example in FIGURE 3, for as many as 10 different groupings of students depending on the district's selection of categories. Read and interpret the Research Code Report in the same manner as the School or District Summary form.

Interpreting the Assessment Data

Importance of Interpretations. The educational assessment program generates a substantial volume of information, and people are sometimes overwhelmed by the data. It is very important for teachers, principals, and other district personnel to reach an understanding of what the assessment data mean to them. In the absence of an "official" interpretation, citizens, parents, or students will be likely to provide their own meanings to the data. If these interpretations are improper or based on limited information, they will be difficult for school personnel to correct.

At the building and district levels, principals and other administrators should make a deliberate effort to disseminate interpretations of the data. Ideally, interpretations should be made with the involvement of the many staff members who are capable of contributing their experience and expertise to any interpretive effort. The meanings of the data should then be made into a public report as soon as possible.

Teachers are advised to make an effort to interpret the test results to students and parents and discuss the tests with them. Teachers should also study the classroom data carefully and attempt to relate this information to their instructional practices.

Considerations in Interpretation of the Assessment Data. There are many reasons why students may not have attained particular objectives. The following are some possibilities but are not meant to be all-inclusive.

1. Objectives. Local educators should consider the appropriateness of the objectives tested for their school or district. Consideration should also be given to whether the skills tested had been taught prior to testing. The minimal objectives were never intended to cover the entire range of teacher's classroom objectives. In fact, since only a sample of minimal objectives is tested, generalizations about student achievement beyond the test are unwarranted.

2. Test Quality. Although a concerted effort was made to create test items that measured the objectives, some lack of matching might have occurred. Other considerations might be: difficulty of the items; confusion in directions; inappropriate terminology or reading level difficulty.

3. Test Administration. Adverse conditions during test administration may account for unexpected test results. An uncomfortable physical setting or a misunderstanding of test procedures by teachers or students was possible. Student attitudes might have interfered if any individual was, for example, excessively anxious or uncooperative. For this reason, a record of adverse testing conditions or of individuals exhibiting atypical behaviors during testing periods should have been kept and should be referred to when interpreting the test results.

4. Instructional Material Used. The objectives tested must be related to existing curriculum and materials. Should these be unrelated to the objectives then some adjustment must be made in interpreting test results. Possibly, changes in available materials or modification of the curriculum would be desirable.

5. Instructional Effectiveness. Poor test performance may be the result of instructional methods which have not been appropriate for some children. Analysis of current practices may indicate that different teaching strategies should be considered. Adoption of more appropriate techniques may lead to increased attainment of the objectives.

Precautions to Be Observed. The data generated by the Michigan Educational Assessment Program constitute a valuable resource for school district personnel. The program provides several different types of data, state norms for the non-achievement variables, and objective-referenced test results. The test results are not only particularly useful but also present a new challenge to educators since the tests are so different from the more common norm-referenced tests. Therefore, it would be useful to consider a few precautions to be observed as data interpretations are made.

1. Use of Minimal Objectives. The performance objectives included in the assessment tests are minimal objectives. That is, these objectives cover some of the skills which most fourth and seventh grade students should possess. They do not cover the entire range of skills that educators would consider important for many students to know in mathematics and reading at the beginning of fourth and seventh grade. Some students will know considerably more in these areas than is measured by these tests. In addition, local school districts may have other important objectives which are unique to the local district.

2. Sampling of Objectives. Because tests designed to measure the complete sets of minimal objectives in mathematics and reading would be prohibitively long, only selected objectives were measured. Since some minimal objectives were not measured, educators should not infer that students have attained all of the minimal objectives, even if they attained all the objectives assessed this year. Follow-up assessment efforts will be needed at the local level to cover the entire set of mathematics and reading minimal performance objectives and any additional performance objectives adopted by the local district.

3. Criterion Levels. The criterion level for attainment of each objective was set by the Department of Education at four out of five test items. Despite this high criterion level, it is possible for a small percentage of students to attain some objectives by guessing, since multiple-choice questions were used. For some objectives, the criterion level may be too high or too low, and this should be considered by local educators when interpreting their assessment results.

4. Quality of Objectives and Items. The performance objectives measured in this year's educational assessment program are a portion of what many knowledgeable people consider to be the minimal skills most fourth and seventh graders should possess. The mathematics objectives tested in the 1974-75 program were reviewed by a representative group of the Michigan Council of Teachers of Mathematics, and, based on their recommendations, some changes in content and placement of the objectives were made. Similar reviews by the Michigan Reading Association were conducted on the reading objectives based on the results of the 1974-75 program. It is still possible, however, that a few of the performance objectives have been incorrectly placed for fourth or seventh graders or that some teachers would disagree with the value of a particular objective.

Certain of the test items which were included to measure a performance objective may constitute a less than ideal measure of that objective. Although an extensive validation procedure was used to eliminate poor items and inappropriate objectives, it is possible that some poor items and inappropriate objectives remain. Local educators should review the objectives for appropriateness and the test items for soundness.

5. Assessment vs Evaluation. Although the distinction is at times subtle, the Michigan Educational Assessment Program was not designed to determine the quality of school district programs. Low scores do not necessarily mean that a school or district is inefficient or uninspiring to students; they only mean that there are large numbers of students with academic needs present—low scores do not say what caused the needs.

6. Responsibility for Needs. The purpose of the objective-referenced tests in mathematics and reading is to pinpoint specific educational needs of students. In attempting to establish the reason why educational needs exist, one should refrain from placing blame on teachers. It is not the purpose of the objective-referenced tests nor the educational assessment program to single out particular teachers for fault or blame but to encourage all of those involved in education (teachers, counselors, administrators, curriculum specialists, board members, parents, students, and others) to examine the results to determine how the entire system can better meet the needs of all students. Because the objectives tested this year reflect skills which may have been taught in several grades (depending on the pace at which students learn), no one teacher was solely responsible for teaching those skills. This fact underscores the need for an examination of the assessment results by representative groups of persons concerned with education.

7. Relationships Among Variables. Past information has indicated that certain financial, socioeconomic, teacher, and student characteristics are related to academic achievement. Some of these relationships are strong, and some are weak; some are direct and some are inverse. The evidence from past MEAP studies and from other large scale research studies is inconclusive as to the nature of the relationships among these variables.

These findings have been derived from research studies utilizing large groups of school districts and schools. It should not be assumed, however, that the relationships among achievement and other variables would be reflected in the reports of individual districts and schools. Moreover, neither the previous research nor the Michigan Educational Assessment Program data have established causal relationships. While causality may actually exist, the present data are not sufficient to demonstrate it.

SECTION III

UTILIZING THE ASSESSMENT DATA

District Utilization

Local school administrators and staff should disseminate the test results and reach some understanding of what the assessment information means to the district. This, however, is not the fullest utilization of the assessment data. District officials may be able to read the data, may share it with school staff, and may make a report to the board and citizens; however, if further efforts are not made, nothing different will happen in the district to meet the educational needs of students.

Each school district is unique, and it is not possible to suggest a series of actions guaranteed to achieve full utilization of assessment data. However, it is possible to list a few steps which may be used as beginning points in the development of utilization strategies:

1. Prioritize educational goals of the school district to determine which goals are of highest importance to educators and citizens.

2. Appoint a curriculum study group in reading and one in mathematics to review the test results and relate them to current teaching strategies.

3. Develop study committees with representatives from the first through fifth grades to discuss the relationships of the fourth grade test results to the curriculum of those grade levels and a similar committee with representatives from the sixth through eighth grades to discuss the seventh grade assessment results.

4. Conduct a study to determine which of the Michigan minimal objectives are being taught in which grades.

5. Analyze other test data available to the district (and other evidence that may be present) and relate them to the MEAP results.

6. Establish a district-wide criterion of success (student attainment rate) for the MEAP objectives and then determine which objectives have not been met successfully.

7. Determine which schools have the lowest attainment rates on the priority objectives and determine strategies to meet these needs.

8. Select one or two schools at both the fourth and seventh grade levels which are willing to become "demonstration sites" to concentrate on utilizing the assessment data.

9. Establish a management-by-objectives system for the schools in which the schools determine which of the MEAP objectives are of highest priority for them and on which they are willing to work to improve student attainment.

10. Provide inservice activities for staff in the development and implementation of objectives-based instructional programs.

11. Develop posttests of selected high priority objectives for administration in May to determine if these objectives have been attained.

12. Report to the board of education throughout the year on the progress being made in interpretation of the data and utilization of the results.

13. Establish two or three year improvement goals for the district leading to increased attainment rates for key objectives.

School Utilization

The school unit is a key element in the utilization of assessment data. The individual school principal and his/her staff form a team which can make instructional changes fairly easily. In addition, there usually is an **esprit de corps** that permits a school staff to muster enthusiasm for an improvement project.

The thirteen steps listed in the previous section set the stage for the suggestions to be outlined below. As before, the emphasis is on having people pull together in an agreed upon direction. The suggestions are as follows:

1. Establish a committee to review the fourth/seventh grade test results. Perhaps two groups would be desirable—one composed of fourth/seventh grade teachers and one of cross-grade level teachers.

2. Conduct a study to determine where the MEAP objectives are currently being presented in the instructional sequence in the building. Determine if there are objectives which staff are not teaching at this time.

3. Review the test results of seventh grade students who were in the same sixth grade school. (The "feeder school option" provides this information.)

4. Establish a criterion level of success for the objectives which is agreeable to the school staff. Identify those objectives which do not meet that level.

5. Select certain high priority objectives for concentrated attention throughout the year. Review the progress made in meeting these objectives and then posttest the objectives.

6. Relate teaching materials in use to the MEAP objectives to determine if there are objectives for which materials are not available. Then, arrange to fill the "material gaps" identified.

7. Provide inservice activities for staff in the development and implementation of objectives-based instructional programs.

8. Develop a student records system based on the objectives being used in the school. Begin this development at the kindergarten level and add one grade each year.

9. Prepare a special, individualized report to parents of their child's assessment results. Discuss this report with the parents.

10. Combine resources with two or three other schools to develop posttests and instructional packages for certain high priority objectives.

11. Obtain copies of the Michigan Reading Association and the Michigan Council of Teachers of Mathematics monographs which offer suggestions for educators in utilizing the assessment test results.[2]

[2]Specific titles are unavailable at press time. The reader should contact a member of these organizations for copies of the booklets.

Teacher Utilization

It is undoubtedly important for the school principal and central office administrators to provide leadership in encouraging utilization of the assessment data, but the teacher is the person who ultimately will use the information with the students. In this respect, the teacher should receive the test data as soon as possible, should be able to read and interpret the report forms, and should know what steps to take to utilize the information.

In general, the teacher should follow the steps outlined in FIGURE 5. This illustration is a flow chart of tasks which begins with the receipt of data and ends with the attainment of the specified objectives by the students. The steps shown are not unique to the Michigan Educational Assessment Program data but are applicable to any instructional management system which is based on student objectives.

The steps outlined in FIGURE 5 are as follows:

1) The tests results for the classroom should be related to the present curriculum to determine where mismatches may occur. Input from other teachers or curriculum committees is important.

2) For any objectives judged to be inappropriate, the data should be disregarded. This decision should not be made lightly since the objectives are considered by many curriculum specialists to be suitable for inclusion as minimal performance expectations.

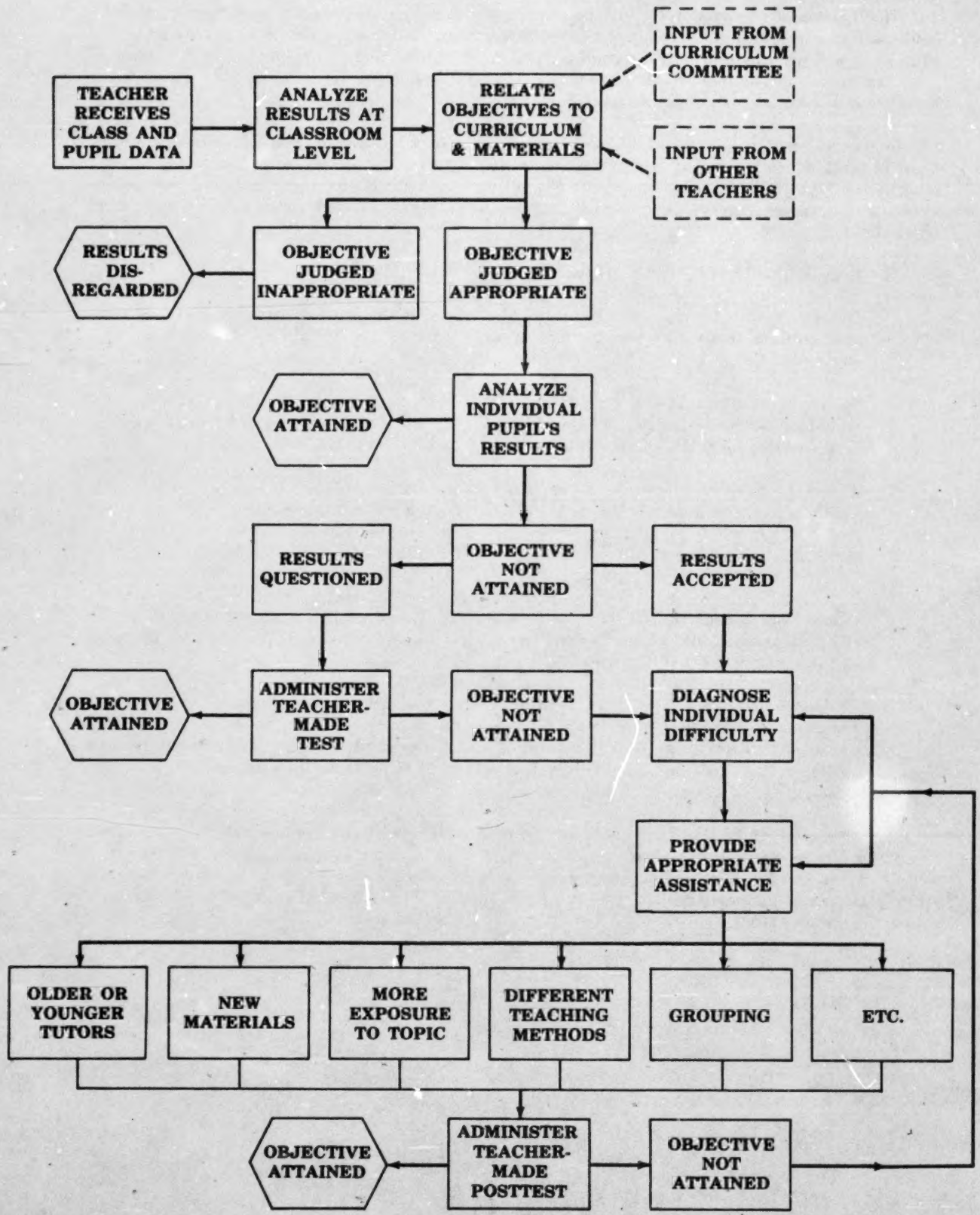
3) If the objective is appropriate, the pupil results should be analyzed to determine whether or not the student attained the objective. If he or she did not attain an objective, the results are either accepted or questioned. If the results are suspect, new data must be collected either through administration of another test or by personal questioning by the teacher.

4) If the test results are accepted as correctly classifying the student, appropriate assistance should be provided. Five suggestions have been made in FIGURE 5, but certainly there are others. The individual teacher should select whatever methods are appropriate for the child and the nature of the difficulties.

5) To determine whether or not remedial instruction was successful, posttests should be given. This does not have to be a complete readministration of the assessment test. The teacher can use several different methods to determine whether or not the student has now attained the objective; the important thing is to gather some sort of evidence the instruction was effective.

The flow chart in FIGURE 5 and the five summary statements above quite naturally are broad. Very specific assistance in the remediation of certain reading and mathematics difficulties can be obtained from local district instructional specialists, curriculum methodology texts, other teachers, or from professional publications. The publications of the MCTM and MRA mentioned previously will be of particular assistance.

FIGURE 5: STEPS FOR TEACHER USE OF MEAP RESULTS



SUMMARY

This report, **Understanding and Utilizing the Data of the 1975-76 Michigan Educational Assessment Program,** is directed toward local school district educators who must understand and utilize the data generated by the Michigan Educational Assessment Program.

The 1975-76 educational assessment used 19 variables in the areas of (a) Human Resources, (b) District Financial Resources, (c) Percent Minority, (d) Dropout Rate, (e) Student Achievement, and (f) Size. These variables were summarized and reported at the student, classroom, school, or district levels. The achievement tests were objective-referenced and were designed to measure learner performance objectives in reading and mathematics at grades four and seven. The objectives and tests were developed in large part by Michigan teachers and curriculum specialists.

The Michigan Educational Assessment Program generates several different types of data:

Classroom Level

1. Individual Student Report
2. Classroom Listing Report

School Level

1. Foil Analysis
2. School Summary Report

District Level

1. Foil Analysis
2. District Summary Report

These reports provide information about each student, classroom, school, and the entire district.

The data returned to each local school district, school, and teacher have great potential for use. However, utilization will occur only if proper interpretations are made and if adequate leadership is provided. Nonattainment of objectives is an important issue, and the reasons for nonattainment are varied. Factors such as adequacy of test items and instructional effectiveness should be investigated. Since all school districts and schools are different in many ways, strategies to achieve utilization will vary; what may work in one district may not work in another.

APPENDIX A

DEFINITIONS OF THE EDUCATIONAL ASSESSMENT MEASURES

DEFINITIONS OF THE EDUCATIONAL ASSESSMENT MEASURES

The 19 measures reported in the 1975-76 Michigan Educational Assessment Program are defined below.

Human Resources

1. Professional instructional staff per 1,000 pupils. The information to compute this measure was taken from the 1974 "Fourth Friday Report." The total number of professional instructional staff was obtained by adding the number of elementary and secondary staff (expressed as full-time equivalency) in the following categories: principals, assistant principals, other administrators (excluding districtwide administrative staff), consultants and supervisors, classroom teachers, librarians, audiovisual staff, guidance personnel and school counselors, psychological staff, radio and television instructional staff, teachers of the homebound, and other instructional staff. The total number of pupils was obtained by counting all pupils enrolled in grades one through twelve **except** special education pupils. Pupils who attended the school for a portion of the day and attended a non-public school for the remainder of the day were included on a full-time equivalency basis. For example, a pupil who attended the school for one-fourth of each day and attended a non-public school for the other three-fourths of each day was counted as one-fourth pupil. In order to obtain the number of professional instructional staff per 1,000 pupils, the total number of professional instructional staff was multiplied by 1,000 and divided by the total number of pupils.

2. Teachers per 1,000 pupils. The information to compute this measure was taken from the 1974 "Fourth Friday Report." The total number of teachers was obtained by adding the number of elementary and secondary classroom teachers. **Kindergarten teachers, special education teachers, and non-classroom teachers were not included in the total.** The total number of pupils was obtained by counting all pupils enrolled in grades one through twelve **except** special education pupils. Pupils who attended the school for a portion of the day and attended a non-public school for the remainder of the day were included on a full-time equivalency basis. In order to obtain the number of teachers per 1,000 pupils, the total number of teachers was multiplied by 1,000 and divided by the total number of pupils.

3. Average years' teaching experience. The information to compute this measure was taken from the 1974 "Fourth Friday Report." The average was obtained by dividing the total years of teaching experience of full-time classroom teachers who work only in a school by the number of such teachers in that school. District level averages were obtained by adding the total years of experience for all schools in the district and dividing by the sum of the full-time classroom teachers in all schools in the district.

4. Percent of teachers with master's degree. The information to compute this measure was taken from the 1974 "Fourth Friday Report." It was obtained by dividing the number of full-time classroom teachers who had completed all of the requirements for a master's degree by the total number of full-time classroom teachers. The resultant value was multiplied by 100 to convert to a percent figure.

5. Average contracted salary of teachers. The information necessary to compute this measure was taken from the 1974 "Fourth Friday Report." It was obtained by dividing the total annual contractual salaries paid to full-time classroom teachers who work only in a school by the number of such teachers in that school. District level averages were obtained by adding the total annual contractual salaries for all schools in the district and dividing by the sum of full-time classroom teachers in all schools in the district.

School District Financial Resources

6. State-equalized valuation per state aid membership (1973-74). The information to compute this measure was taken from records filed with the Michigan Department of Education. The total state-equalized valuation (SEV) is equal to approximately 50 percent of the fair cash value of the real and personal property in the district. It is calculated as of May 28, 1973 (the fourth Monday in May) and applied to the 1973-74 academic year. In order to obtain a per-pupil value for SEV, the total SEV was divided by the state aid membership for the 1973-74 academic year. The state aid membership is the total number of pupils enrolled in the district as of September 28, 1973, the fourth Friday after Labor Day.

7. Local revenue per pupil (1973-74). The information to compute this measure was taken from records provided by the local districts and filed with the Michigan Department of Education. The financial information was reported in the Annual School District Financial Report for the fiscal year which ended June 30, 1974. The total value for local revenue included revenue from sources such as the following: property tax (the major source of local revenue), local government appropriations, tuition, transportation fees, revolving funds (i.e., revenue from food services, book stores, and student body activities), rent from school facilities, etc. Tuition from community college patrons was not included in the calculation. In order to obtain local revenue per pupil, total local revenue was divided by the state aid membership (the total number of pupils enrolled in the district as of September 28, 1973, the fourth Friday after Labor Day).

8. State school aid per pupil (1973-74). The information to compute this measure was taken from records provided by the local districts and filed with the Michigan Department of Education. The financial data were taken from the Annual School District Financial Report for the fiscal year which ended June 30, 1974. The value for total state school aid represented the direct appropriations from the state, **including appropriations for state school aid, driver education, underprivileged children, and other state grants.** In order to compute the state school aid per pupil, the total state school aid was divided by 1973-74 state aid membership.

9. K-12 intructional expense per pupil (1973-74). The information to compute this measure was taken from records provided by the local districts and filed with the Michigan Department of Education. The financial information was reported in the Annual School Financial Report for the fiscal year which ended June 30, 1974. The total K-12 instructional expense included expenditures for salaries and supplies connected with elementary education, secondary education, special education, summer school, and adult education. Expenditures associated with community colleges were omitted from the calculation. In order to obtain a value for **instructional expense per pupil,** total K-12 instructional expense was divided by the 1973-74 state aid membership.

10. Elementary instructional expense per pupil (1973-74). The information to compute this measure was taken from financial reports provided by the local districts and filed with the Michigan Department of Education. Financial information was reported in the Annual School District Financial Report for the fiscal year which ended June 30, 1974. The elementary instructional expense included expenditures for salaries and supplies connected with elementary education. In order to obtain a value for elementary instructional expense per pupil for districts organized to operate a high school, total elementary instructional expense was divided by the elementary state aid membership, taken from the 1973-74 "Fourth Friday Report." For districts not organized to operate a high school (i.e., those that operate no grade above grade 8) total elementary instructional expense was divided by the K-8 state aid membership. Pre-kindergarten and special education pupils were not included.

11. Total current operating expense per pupil (1973-74). The information to compute this measure was taken from records provided by the local districts and filed with the Michigan Department of Education. The financial information was reported in the Annual School District Financial Report for the fiscal year which ended June 30, 1974. The total current operating expense included expenses connected with administration, attendance, health services, pupil transportation, plant operation, plant maintenance, and fixed charges in addition to instructional expenses (including

elementary, secondary, special education, summer school, and adult education instructional expenses). Community college expenses were not included in the computation of total operating expense. The value for total current operating expense was divided by the 1973-74 state aid membership.

12. Total operating millage (1973-74). The information to compute this measure was taken from records provided by intermediate districts and filed with the Michigan Department of Education. Millage information was reported on the form "1973-74 Tax Levies of School Districts Based on 1973 State Equalized Valuation" submitted to the Department in November of 1972 for the 1973-74 school year. Total operating millage is the tax rate in mills applied to the state-equalized valuation of a district to produce revenue for the operation of its schools (not including building and site or debt retirement millage).

Percent Minority

13. Percent of racial-ethnic minority students. Percent of racial-ethnic minority students was computed for each school in the state. The information to compute this measure was taken from the 1974 "Fourth Friday Report." The total number of racial-ethnic minority students included all racial-ethnic minority students in the school. Pre-kindergarten students, kindergarten students, special education students, and part-time students were all included in the total. Since the information was expressed in terms of a head count, part-time students were not counted differently from full-time students. Students were classified as belonging to a racial-ethnic minority group if they were considered by the school to be of that group. Pre-kindergarten students, kindergarten students, special education students, and part-time students were included in the total. In order to calculate the percent of racial-ethnic minority students, the total number of racial-ethnic minority students was divided by the total number of students and the resultant figure was multiplied by 100.

Dropout Rate (1973-74)

14. School dropout rate. School dropout rate was computed from information taken from records provided by the local districts and filed with the Michigan Department of Education. The measure was based on figures from the local districts' School Dropout Report and enrollment of students in grades 9-12 during the 1973-74 academic year. Included as dropouts were students who left school for any of the following reasons: married, sent to corrective institutions, accepted employment, or dropped from attendance roll because absent 10-30 days. Not included as dropouts were students who left the district because they transferred to another district, were committed to mental health institutions, or became sick or died. The dropout rate is calculated by dividing the number of dropouts by the sum of the number of students enrolled in grades 9-12 on the "Fourth Friday" plus new students enrolled during the year, computed from the 1973-74 School Dropout Report. The resultant figure was multiplied by 100.

Achievement

15. Reading. The reading tests are described in Section I of this report.

16. Mathematics. The mathematics tests are described in Section I of this report.

Size Measures.

17. Grade 4 membership. Grade 4 membership was obtained by counting all full-time pupils enrolled in grade 4 except special education pupils.

18. Grade 7 membership. Grade 7 membership was obtained by counting all full-time pupils enrolled in grade 7 except special education pupils.

19. Total membership. Total membership was obtained by counting all full-time pupils in all grades operated by the district from kindergarten through 12th grade, except special education pupils.

APPENDIX B

K-12 DISTRICT AND SCHOOL NORMS

K-12 DISTRICT NORMS

MICHIGAN

PERCENTILE DISTRIBUTION	HUMAN RESOURCES (1) PROF. INSTRUCTIONAL STAFF PER 1,000 PUPILS	(2) TEACHERS PER 1,000 PUPILS	(3) AVERAGE YEARS TEACHING EXPERIENCE	(4) PERCENT TEACHERS WITH MASTERS DEGREE	(5) AVERAGE CONTRACTED SALARY OF TEACHERS	DISTRICT FINANCIAL RESOURCES (6) SEV PER RESIDENT MEMBER (1973-74)	(7) LOCAL REVENUE PER PUPIL (1973-74)	(8) STATE SCHOOL AID PER PUPIL (1973-74)	(9) K-12 INSTRUCTIONAL EXPENSE PER PUPIL (1973-74)	(10) ELEMENTARY INSTRUCTIONAL EXPENSE PER PUPIL (1973-74)	(11) TOTAL CURRENT OPERATING EXPENSE PER PUPIL (1973-74)	(12) TOTAL OPERATING MILLAGE (1973-74)	PERCENT MINORITY (13) PERCENT OF RACIAL-ETHNIC MINORITY STUDENTS	DROPOUT RATE (14) SCHOOL DROPOUT RATE (1973-74)	SIZE MEASURE (20) TOTAL MEMBERSHIP	PERCENTILE DISTRIBUTION
95	60.2	52.4	12.6	53.5	15377	42808	1113	659	920	823	1249	31.51	22.8	10.4	11510	95
90	57.8	49.6	11.8	46.9	14577	33568	927	632	856	774	1170	29.00	13.5	9.1	7494	90
85	55.6	48.3	11.0	43.2	13920	29366	823	611	809	731	1087	27.69	8.7	8.1	5836	85
80	54.2	47.2	10.7	38.1	13401	26949	751	596	775	696	1049	26.59	5.9	7.5	4532	80
75	53.2	46.2	10.4	35.7	13096	24417	693	576	743	664	1017	25.65	5.0	7.0	3940	75
70	52.2	45.5	10.0	33.7	12811	22731	633	560	721	635	993	24.89	3.8	6.6	3367	70
65	51.5	44.9	9.6	31.5	12506	21347	577	546	700	618	978	24.10	3.3	6.1	2887	65
60	51.1	44.4	9.3	29.3	12347	20011	544	531	687	606	961	23.58	2.7	5.8	2521	60
55	50.5	43.9	8.9	27.8	12213	18816	517	514	672	593	945	23.00	2.1	5.5	2289	55
50	50.0	43.4	8.5	26.3	12068	17608	493	500	658	575	926	22.58	1.7	5.1	2092	50
45	49.4	43.0	8.3	24.8	11876	16831	465	476	645	565	910	22.00	1.5	4.7	1895	45
40	48.9	42.6	8.0	23.5	11701	16147	449	451	636	556	896	22.00	1.3	4.4	1704	40
35	48.4	42.0	7.8	21.8	11585	15409	422	420	626	545	886	21.50	1.1	4.0	1467	35
30	47.6	41.6	7.5	20.2	11426	14599	402	389	615	531	872	21.00	1.0	3.8	1330	30
25	47.2	41.0	7.2	18.1	11268	13733	375	354	606	518	858	20.23	.8	3.4	1150	25
20	46.6	40.6	6.8	16.6	11086	12953	364	296	597	506	838	20.00	.7	3.0	917	20
15	45.9	39.9	6.5	14.9	10844	12100	343	249	584	481	825	19.43	.6	2.5	803	15
10	44.8	39.3	6.1	13.3	10537	11500	316	160	568	467	801	18.25	..4	2.0	626	10
5	43.4	37.7	5.3	10.0	10070	10493	280	64	543	437	784	17.00	.1	1.4	365	5
Mean	50.7	44.2	8.8	28.3	12296	20978	570	450	689	603	959	23.28	5.8	5.4	4056	
Standard Deviation	5.4	5.0	2.2	13.2	1551	10995	265	174	119	125	151	4.25	11.8	2.8	12439	
Number of Schools	530	530	530	530	530	531	531	531	531	531	531	531	530	531	531	

August, 1975

SCHOOL NORMS

(Schools in K-12 Districts only)

GRADE 4

PERCENTILE DISTRIBUTION	HUMAN RESOURCES (1) PROF. INSTRUCTIONAL STAFF PER 1,000 PUPILS	(2) TEACHERS PER 1,000 PUPILS	(3) AVERAGE YEARS TEACHING EXPERIENCE	(4) PERCENT TEACHERS WITH MASTERS DEGREE	(5) AVERAGE CONTRACTED SALARY OF TEACHERS	PERCENT MINORITY (13) PERCENT OF RACIAL-ETHNIC MINORITY STUDENTS	SIZE MEASURE (20) TOTAL MEMBERSHIP
95	62.1	51.3	16.6	62.5	16626	97.8	779
90	58.0	48.1	15.1	55.5	16176	51.6	661
85	55.3	46.5	13.8	50.0	15721	27.6	597
80	53.8	45.1	13.0	46.1	15245	16.8	545
75	52.3	44.0	12.3	42.3	14817	10.8	512
70	51.1	43.1	11.6	39.1	14384	7.0	481
65	50.0	42.1	11.0	36.3	14082	5.0	459
60	49.0	41.5	10.5	33.3	13801	3.8	434
55	48.2	40.8	10.0	30.7	13531	3.0	411
50	47.4	40.2	9.6	28.5	13227	2.5	389
45	46.5	39.5	9.2	25.0	12935	2.0	367
40	45.7	38.9	8.8	23.3	12640	1.6	349
35	44.8	38.2	8.3	20.8	12339	1.4	328
30	44.0	37.6	7.8	18.7	12081	1.2	309
25	43.1	37.0	7.3	16.6	11797	.9	284
20	42.2	36.4	6.8	13.6	11488	.7	256
15	41.1	35.8	6.2	10.0	11138	.5	223
10	39.8	34.9	5.6	6.6	10782	.2	184
5	38.2	33.8	4.6	.0	10333	.0	145
Mean	48.4	41.0	10.0	29.9	13329	14.4	417
Standard Deviation	8.0	5.6	3.7	18.8	2033	27.1	208
Number of Schools	2364	2364	2364	2364	2364	2364	2364

August, 1975

SCHOOL NORMS

(Schools in K-12 Districts only)

GRADE 7

PERCENTILE DISTRIBUTION	HUMAN RESOURCES (1) PROF. INSTRUCTIONAL STAFF PER 1,000 PUPILS	(2) TEACHERS PER 1,000 PUPILS	(3) AVERAGE YEARS TEACHING EXPERIENCE	(4) PERCENT TEACHERS WITH MASTERS DEGREE	(5) AVERAGE CONTRACTED SALARY OF TEACHERS	PERCENT MINORITY (13) PERCENT OF RACIAL-ETHNIC MINORITY STUDENTS	SIZE MEASURE (20) TOTAL MEMBERSHIP
95	64.7	55.7	15.0	64.1	16477	90.2	1228
90	60.6	51.7	13.0	57.5	15856	42.3	1077
85	58.0	49.5	11.8	52.9	15288	22.7	972
80	56.3	48.3	11.1	50.0	14930	15.8	883
75	54.6	47.1	10.5	47.0	14600	9.5	828
70	53.6	46.4	10.0	43.2	14232	6.9	778
65	52.9	45.5	9.4	40.0	13849	4.7	736
60	51.9	45.0	9.0	37.0	13527	3.6	684
55	51.0	44.4	8.6	34.7	13109	2.8	645
50	50.2	43.7	8.2	33.3	12725	2.2	612
45	49.6	43.1	7.8	30.0	12518	1.8	570
40	48.9	42.3	7.4	27.7	12222	1.5	537
35	48.1	41.6	7.1	25.6	12014	1.3	490
30	47.2	40.9	6.7	23.5	11723	1.0	454
25	46.5	40.0	6.2	21.0	11457	.8	409
20	45.5	39.3	5.9	18.1	11210	.7	374
15	44.3	38.3	5.5	15.1	10951	.5	334
10	42.5	36.8	5.0	11.7	10590	.2	278
5	39.8	35.5	4.2	7.1	10105	.0	207
Mean	51.5	44.4	8.6	34.0	13054	13.3	650
Standard Deviation	10.8	8.2	3.2	17.7	2038	25.4	321
Number of Schools	845	845	845	845	845	845	845

August, 1975

APPENDIX C

MINIMAL PERFORMANCE OBJECTIVES MEASURED IN THE 1975-76 MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM, GRADES FOUR AND SEVEN

READING OBJECTIVES
MEASURED IN THE 1975-76
MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM*
Grade 4

	Objective Number	
1.	2.1	Given a reading selection at the third grade level, the learner will match a series of words in the selection with appropriate definitions.
2.	2.2	Given a set of phrases, the student will indicate those phrases which have the same meaning.
3.	3.2	Given a reading selection at the third grade level in which every fifth word has been replaced with a blank, the learner will choose the exact word appropriate to the blank space at 50% accuracy.
4.	4.1	Given a method of arranging data, the learner will identify the method (e.g., color, size, importance, time, etc.)
5.	4.4	Given a series of randomly placed words, the learner will be able to alphabetize the words through the first three letters.
6.	5.1	Given a series of reading selections, the learner will indicate those which are factual.
7.	5.2	Given a series of reading selections, the learner will indicate those which are fictional.
8.	6.1-6.3	Given a reading selection, the learner will be able to identify the author's purpose (e.g., persuasion, entertainment, propaganda, etc.)
9.	7.1	Given a reading selection at the third grade level, the learner will select from a list of possible titles the one most appropriate as the title for that selection.
10.	7.2	Given a reading selection at the third grade level, the learner will select from a series of still pictures the one picture most appropriate in depicting the main idea of the selection.
11.	7.3	Given a reading selection at the third grade level, the learner will select from a number of short summaries the one which best summarizes the selection.
12.	8.4	Given a reading selection at the third grade level, the learner will match a series of direct quotations from the story with the character who is speaking.
13.	10.3	Given a reading selection at the third grade level, the learner will choose from a series of sentences that sentence which best describes how a given character feels in a story.
14.	10.6	Given a selection containing figurative language, the learner will identify from a series of descriptive phrases the phrase that most accurately describes the mood expressed in the selection.

*This list contains only the objectives which are included in the every-pupil portion of the 1975-76 MEAP tests. A complete set of the objectives is available in **Minimal Performance Objectives for Communication Skills Education in Michigan**, Michigan Department of Education.

15. 11.1 Given a reading selection at the third grade level, the learner will correctly match a series of causes with a corresponding series of effects.

16. 11.2 Given a reading selection at the third grade level with the conclusion of the story deleted, the learner will select from a series of possible conclusions the one most appropriate to the selection.

17. 13.1 Given a locational question, the learner will choose from a series of reference sources where that item will be found.

18. 13.2 Given a locational question about newspapers, the learner will select the section where he would find the answer.

19. 14.1-14.3 Given a reading selection at the third grade level, the learner will answer correctly a series of multiple choice questions relating to meanings, generalizations, or conclusions not expressed in the selection itself.

READING OBJECTIVES
MEASURED IN THE 1975-76
MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM
Grade 7

	Objective Number	
1.	18.1	Given a reading selection at the sixth grade level, the learner will match a series of words in the selection with appropriate definitions.
2.	18.2	Given a set of phrases, the learner will indicate those phrases which have the same meaning.
3.	20.1	Given a method of arranging data, the learner will identify the method (e.g., sequence, importance, etc.).
4.	21.1	Given a series of randomly placed words, the learner will be able to alphabetize the words through the first three letters.
5.	22.1	Given a series of reading selections, the learner will indicate those which are factual.
6.	22.2	Given a series of reading selections, the learner will indicate those which are fictional.
7.	23.1-23.3	Given a reading selection, the learner will be able to identify the author's purpose (e.g., persuasion, entertainment, propaganda, etc.).
8.	24.1	Given a reading selection at the sixth grade level, the learner will select from a list of possible titles the one most appropriate as the title for that selection.
9.	24.2	Given a reading selection at the sixth grade level, the learner will select from a series of still pictures the one picture most appropriate in depicting the main idea of the selection.
10.	24.3	Given a reading selection at the sixth grade level, the learner will select from a number of short summaries the one which best summarizes the selection.
11.	24.4	Given a series of three or more reading selections at the sixth grade level, the learner will indicate the two most alike in the ideas expressed.
12.	25.3	Given a reading selection at the sixth grade level, the learner will match a series of direct quotations from the story with the character who is speaking.
13.	26.3	Given a reading selection at the sixth grade level, the learner will correctly answer a series of multiple choice questions relating to the sequence of events or ideas presented in the selection.
14.	27.2	Given a reading selection at the sixth grade level, the learner will choose from a series of sentences that sentence which best describes how a given character feels in a story.
15.	28.1	Given a reading selection at the sixth grade level, the learner will choose from a series of sentences the one which best describes a motive for some action or activity.
16.	29.1	Given a reading selection at the sixth grade level, the learner will correctly match a series of causes with a corresponding series of effects.

17. 29.4 Given a reading selection at the sixth grade level, the learner will answer correctly a series of multiple choice questions relating to meanings, generalizations, or conclusions not expressed in the selection itself.

18. 31.1 Given a locational question, the learner will choose from a series of reference sources where that item will be found.

19. 31.2 Given a locational question about newspapers, the learner will select the section where he would find the answer.

20. 32.1 Given a reading selection at the sixth grade level with the conclusion of the story deleted, the learner will select from a series of possible conclusions the one most appropriate to the selection.

MATHEMATICS OBJECTIVES
MEASURED IN THE 1975-76
MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM*
Grade 4

Objective Number		
1.	AR-I-A-6	Given a set of objects, the learner will recognize objects that are the same **size.**
2.	AR-I-A-8	Given an object shaped like a circle, triangle, square, or rectangle, the learner will choose the shape the object represents.
3.	AR-I-A-16	Given a set of three containers, one full, one empty, and one half-filled, the learner will choose the containers that are arranged from full to empty.
4.	AR-I-A-24	Given a collection of five objects of varying lengths, the learner will identify the **longest** or the **shortest,** as requested.
5.	AR-I-A-39	Given five small toys in a line, the learner will identify the **first** toy and the **last** one.
6.	AR-I-B-7	Given a set with less than ten objects, the learner will identify an equivalent set.
7.	AR-I-B-32	Given a set of two to eight objects, the learner will identify a set having fewer members than the original set.
8.	AR-I-B-40	Given a line marked with congruent segments and a set of number cards (0-10), the learner will choose the appropriate number card for the point on the line.
9.	AR-I-B-43	Given any three numbers, 0-10, the learner will identify which number is the greatest and which is the least, on request.
10.	AR-I-B-44	Given two consecutive even or odd numbers, 0-9, the learner will name the number that comes **between** the two given numbers.
11.	AR-I-B-45	Given a number from 1 to 8, the learner will identify the number that comes **before** or **after** the given number.
12.	AR-I-B-64	Given a set of tens and ones representing a number less than 100, the learner will identify the numeral.
13.	AR-I-B-65	Given a set of sequentially ordered whole numbers within a decade less than 100, such as 31, 32, . . .40, the learner will identify the number that comes immediately before or after a given number, as requested.

*This list contains only the objectives which are included in the every-pupil portion of the 1975-76 MEAP tests. A complete set of the objectives is available in the **Minimal Performance Objectives for Mathematics in Michigan,** Michigan Department of Education, 1973. The wording of the objectives in this APPENDIX may be different from the original wording as contained in the publication cited above. These minor wording changes were necessitated by the group-administered nature of the items developed to measure the objectives.

14.	AR-I-B-67	Given 2 two-digit numbers, the learner will tell which number is greater and which number is less.
15.	AR-I-B-70	Given a set of dimes and pennies valued between 11 and 99 cents (one dime, one penny to nine dimes, nine pennies), the learner will state the value.
16.	AR-I-B-81	Given a random list of two- or three-digit numbers, the learner will identify the list that is in ascending order.
17.	AR-I-B-82	Given 2 three-digit numbers which have the same digits but in different positions, the learner will compare them to determine which is greater and which is less.
18.	AR-I-B-84	Given a counting sequence of two or four numbers, the learner will write the next number in the sequence.
19.	AR-I-B-85	Given the counting numbers 1-10, the learner will indicate those that are multiples of 2.
20.	AR-I-B-86	Given a set of objects, the learner will select another set that will have twice as many objects.
21.	AR-II-A-10	Given addition exercises involving a two-digit number plus a one-digit number requiring no regrouping (carrying), the learner will find the sums with or without the use of aids.
22.	AR-II-B-9	Given a set of objects or pictures showing a subtraction relationship with combinations to 18, the learner will identify an appropriate number sentence.
23.	AR-II-B-11	Given a subtraction word problem read by the teacher involving combinations to 18, the learner will: 1) identify the operation, 2) identify an appropriate number sentence, and 3) identify the answer.
24.	AR-II-B-13	Given two sets of objects, one with more objects than the other, the learner will identify how many more members it has.
25.	AR-II-B-15	Given a two-digit number, the learner will subtract one-digit numbers with no regrouping (borrowing) with or without the use of aids.
26.	AR-II-B-16	Given a two-digit number, the learner will subtract a two-digit number with no regrouping (borrowing).
27.	M-II-A-6	Given the reading "_____o-clock" and a clock face, the learner will identify the clock showing the appropriate time.
28.	M-II-B-3	Given three to five different amounts of money, all less than or equal to $5.00, the learner will identify the greatest or the least.
29.	M-II-C-1	Given a Fahrenheit or Centigrade thermometer, the learner will identify the temperature (above zero) to the nearest degree.
30.	G-I-A-2	Given pictures of various shapes, the learner will identify circles, triangles, squares, and rectangles as requested.

MATHEMATICS OBJECTIVES
MEASURED IN THE 1975-76
MICHIGAN EDUCATIONAL ASSESSMENT PROGRAM
Grade 7

Objective Number		
1.	AR-I-B-87	Given any four-digit number, the learner will identify the number that is 100 or 1000 more or less than it is, without using formal addition or subtraction.
2.	AR-I-B-89	Given a number orally, the learner will identify the arabic numeral.
3.	AR-II-A-22	Given addition exercises involving a three-digit number plus a one-, two-, or three-digit addend, with or without regrouping (carrying), the learner will identify the sums, using any techniques.
4.	AR-II-A-26	Given addition problems involving two or three addends with three, four, five, or six digits, with or without regrouping, the learner will find the sums, using any techniques.
5.	AR-II-B-20	Given a three-digit number, the learner will subtract a two or three-digit number, with or without the use of aids.
6.	AR-II-C-6	Given a repeated addition sentence, the learner will represent it as a multiplication sentence with its product.
7.	AR-II-C-11	Given two numbers, the learner will demonstrate that the order in which they are multiplied does not change the product.
8.	AR-II-C-13	Given a one-digit number and (10,20...), (100,200...), the learner will identify the product.
9.	AR-II-C-15	Given a two-digit number to be multiplied by a one-digit number, the learner will identify the product, with or without aids.
10.	AR-II-D-5	Given a sentence with one single digit, a missing factor, and a product (whole numbers), the learner will identify the missing factor.
11.	AR-II-D-7	Given a division fact, the learner will identify it rewritten as a multiplication fact.
12.	AR-II-D-9	Given a one-digit divisor (factor) and a dividend (product) of less than 100, the learner will identify the quotient (missing factor) if there is no remainder.
13.	AR-II-D-15	Given an exercise with a dividend of four digits or less, and a one-digit divisor, the learner will identify the quotient.
14.	AR-III-A-1	Given several objects, some divided into congruent parts, some divided into noncongruent parts, the learner will identify congruent parts.
15.	AR-III-A-18	Given a diagram divided into congruent parts, with some parts shaded, the learner will identify the shaded area by identifying an appropriate fraction.
16.	AR-III-A-19	Given any five fractions with like denominators, in random order, the learner will identify them in order (halves, thirds, fourths, fifths, sixths, eighths, tenths); with or without the use of aids.

17. AR-III-B-4 Given two common fractions with like denominators and a sum greater than 1, the learner will identify the sum, with or without the use of fractional cut-out parts.

18. AR-III-B-7 Given two mixed numbers with like denominators, the learner will identify the sum.

19. AR-III-C-4 Given a mixed number and a fraction with like denominators, of 2, 3, 4, 6 or 8, where no regrouping is necessary, the learner will find the difference.

20. AR-III-C-6 Given a whole number and a common fraction with a denominator of 2, 3, 4, 6, or 8, the learner will find the difference with or without the use of fractional parts.

21. AR-III-D-4 Given two unit fractions with denominators less than seven, the learner will identify the product with or without the use of a model.

22. AR-IV-A-3 Given a model of a fraction illustrating hundredths, the learner will identify the decimal fraction as illustrated.

23. AR-IV-A-7 Given a decimal fraction of no more than three places, the learner will name the place value of each digit, without aids.

24. AR-IV-B-3 Given a verbal problem involving addition and subtraction of decimal numbers involving only tenths, the learner will find the answer.

25. AR-IV-B-6 Given a verbal problem involving addition and subtraction of decimal numbers involving tenths and hundredths, the learner will find the answer.

26. AR-IV-B-9 Given an addition and subtraction decimal problem in horizontal or vertical form with no more than five (5) digits and no more than three (3) decimal places, the learner will find the sum or difference.

27. AR-VI-15 Given a picture of sets paired in (A) a one-to-one, (B) a many-to-one, or (C) a one-to-many ratio and part of another pair, the learner will identify the pair that keeps the ratio equivalent.

28. M-I-B-8 Given a polygon, the learner will estimate its area in square units.

29. M-I-C-7 Given a drawing of a rectangular solid divided into units (dimensions less than or equal to 5 units), the learner will name the number of units in it.

30. M-II-A-10 Given a clock face with hands on it, the learner will choose the correct time notation.

31. M-II-A-11 The learner will use A.M. and P.M. notation in writing time.

32. M-II-B-7 Given two money values, the learner will add or subtract using dollars and cents notation.

33. M-II-B-9 Given verbal problems consisting of one or two operations involving money values less than or equal to $20, the learner will solve the problems.

34. M-II-C-3 Given a Fahrenheit or Centigrade thermometer the learner will identify temperatures to the nearest degree, using the degree [°] symbol.

35. G-I-A-4 Given a set of quadrilaterals, the learner will identify and name a parallelogram, a square, and a rectangle.

36. G-I-B-5 Given the description of a plane, and a part of a plane, the learner will identify surfaces which represent a plane or part of a plane.

37. AL-2 Given a statement of equality involving addition, subtraction, or multiplication facts and containing a placeholder or letter, the learner will identify the missing number.

38. AL-4 Given a pair of whole numbers or number phrases less than 1,000, the learner will identify the appropriate symbol of equality or inequality, < or = or >.

39. AL-5 Given an equation involving one or zero, the learner will complete the sentence.

40. AL-7 Given a numerical statement involving distributive property and a placeholder, the learner will insert the missing value.